PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P0067PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IB 02/03793	International filing date *(day/month/year)* 16.09.2002	Priority date *(day/month/year)* 22.04.2002
International Patent Classification (IPC) or both national classification and IPC F16G11/12		
Applicant VON SEIDEL, Michael		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
23.07.2003	19.07.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Hytrowski, P Telephone No. +49 89 2399-2858

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB 02/03793

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-3, 6-16	as originally filed
4, 4a, 5	received on 06.04.2004 with letter of 20.03.2004

Claims, Numbers

1-14	received on 06.04.2004 with letter of 20.03.2004

Drawings, Sheets

1/5-5/5	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:
D1: US-A-2 577 299

No document of the prior art discloses the entire features of claims 1 and 12.

The subject-matter of claims 1 and 12 is therefore new (Article 33(2) PCT).

The document **D1** is regarded as being the closest prior art to the subject-matter of claims 1 and 12 and shows a spool having a shank with a laterally offset anchorage stud formation at one end, a radially extending arm portion at the opposite end and a hooklike portion at the free end of the arm. Once the wire has been tensioned, the hooklike portion is hooked over the wire to prevent it from rotating with consequent unwinding the wire. The drawback with this arrangement is that each half turn results in two half revolutions of wire being wound generally circumferentially onto the shank thereby providing inadequate fineness of adjustment of the tension.

The object of the invention is to alleviate this drawback.

The solution of claim 1 provides transverse retainer formations which are adapted operatively to prevent unravelling off the shank of cord wound around the elongate shank at least whilst the cord is held under tension and the axis of the shank extends in the same general direction as in which the cord extends.

Such transverse retainer formations are neither shown nor suggested in the prior art.

Claim 12 refers to a method of shortening a cord comprising at least the step of associating the keeper formation of a spool as claimed in claim 1.

Claims 1 and 12 comply with Article 33(3) PCT.

Claims 2 to 11 and 13 and 14 are dependent on claims 1 and 12, respectively and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Remark:

The description is not properly adapted to the claims as the passages from page 4a, line 6 to page 5, line 2 and in page 6, last paragraph do not correspond to the wording of claims 1 and 12, respectively (Article 6 PCT).

As regards the tensioning of other elongate tension members such as clotheslines, ropes and the like many of the prior art expedients of which applicant is aware employ a spool of some sort around which the tension member is wound in a plane that is at generally right angles to the axis about which the spool is rotated. Typical of this type of tensioner are those described in French patent 2,564,024; German patent DE 19700186; and US patents 559,133; 912,960; 1,191,598; 1,261,505; 1,476,026; 1,663,182; 1,670,257; 1,951,898; 1,972,321; 2,311,792 5,012,559; and 5,170,536.

US patent 2,577,299 is a particular example of the latter type of spool and discloses a spool having a shank with a laterally offset anchorage stud formation at one end, a radially extending arm portion at the opposite end, and a hooklike portion at the free end of the arm. With the axis of the spool at generally right angles to the length of a wire to be tensioned a special tool is engaged with the end of the spool opposite the arm and the anchorage stud formation is engaged with the wire to cause it to start winding from both directions onto the shank portion. Once the wire has been tensioned, the hooklike portion is hooked over the wire to prevent it from rotating with consequent unwinding of the wire. The difficulty with this arrangement is that each half turn results in two half revolutions of wire being wound generally circumferentially onto the shank thereby providing inadequate fineness of adjustment of the tension. Also, the geometry of the shank being at right angles to the wire requires a number of revolutions of wire to be wound onto the shank in order that one end or the other does not disengage either the anchorage stud formation or the hook formation.

Other tensioners employ spaced formations adapted to take up a predetermined amount of cord length that may be selected from a plurality of different amounts and some of such tensioners are described in US patents 5,655,267; 5,519,921; 5,383,256; 3,815,180; 3,711,901; 1,855,049; 550,970; and 432,429.

OBJECT OF THE INVENTION

It is, accordingly, an object of this invention to provide a method and spool for shortening the effective length of a cord whilst optionally tensioning same, whereby

at least some of the disadvantages associated with prior art devices referred to above may be obviated, at least some extent.

SUMMARY OF THE INVENTION

In accordance with one aspect of the invention there is provided a spool for shortening the length of a cord and optionally tensioning it at the same time, the spool comprising a reel formation around which cord can be wound to shorten its effective length, formations for operatively preventing cord wound onto the reel from unwinding therefrom and means whereby the reel can be rotated either directly by hand or indirectly utilizing a tool, the spool being characterized in that the reel is in the form of an elongate generally straight shank around which cord is to be wound, the shank having two ends each of which has a transverse retainer formation adapted operatively to prevent unravelling off the shank of cord wound around the elongate shank, at least whilst it is held under tension, when the axis of the shank extends in the same general direction as that in which the cord extends; a keeper

formation is located at one end of the shank; and the torque transmitting formation is located at the other end of the shank.

Further features of the invention provide for the transverse retainer formation at said one end of the shank to form also the keeper formation; for the retainer formation at the other end of the shank to form also the torque transmitting formation; for the length of the shank to be from about 10 to about 50 times the diameter thereof, preferably from 15 to 40 times the diameter; and for additional holding means to be provided for releasably engaging a cooperant cord to prevent unravelling thereof off the shank under conditions in which tension is removed from the cord.

In one preferred form of the invention the spool is formed from a suitable gauge of wire or rod that is bent to form a generally straight shank in the middle; a combination retainer formation and keeper formation at one end; and a combination retainer formation and torque transmitting formation at the other end. In that case the wire or rod can also be bent and optionally stamped to form any additional holding means for releasable engagement with a cooperating cord. Alternatively, any additional holding means could be formed as part of a separate element for attachment to a handle of the spool. Of course, no additional holding means is required, and in the simplest forms of the invention such an expedient is omitted in order to save cost. As a general rule, such additional holding means is only required to prevent unravelling of any cord wound onto it when tension is substantially entirely removed from the cord as tension in the cord substantially locks the spool against unravelling of cord therefrom.

In instances in which expedience dictates that the torque transmitting formation preferably be a manually operable handle, and in this regard a spool for shortening picture cords to thereby adjust the height of an associated picture is of particular note, such formation is simply formed integral with the spool generally as a continuation of a length of bent wire or rod. Typically the handle could be wing shaped to project outwardly on diametrically opposite sides of the shank and the

CLAIMS:

1. A spool (1, 10, 21, 22, 35) for shortening the length of a cord (14) and optionally tensioning it at the same time, the spool comprising a reel formation in the form of an elongate generally straight shank (2, 12, 23, 31, 37, 41, 55) around which cord can be wound to shorten its effective length, the shank having a transverse retainer formation (4, 13, 20, 40, 51 and 5, 11, 25, 33, 36, 42, 49, 50, 58) at each of its ends for operatively preventing cord wound onto the reel from unwinding therefrom, a keeper formation (4, 13, 20, 40, 51) at one end of the shank for cooperation with a cord to maintain said end in association with the cord whilst the shank is rotated to wind cord onto the shank by rotation thereof and a torque transmitting formation (5, 11, 25, 33, 36, 42, 49, 50, 58) whereby the reel can be rotated about its own axis either directly by hand or indirectly utilizing a tool (44, 52), the spool being characterized in that the transverse retainer formations are adapted operatively to prevent unravelling off the shank of cord wound around the elongate shank at least whilst the cord is held under tension and the axis of the shank extends in the same general direction as that in which the cord extends; and in that the keeper formation is located at one end of the shank and the torque transmitting formation is located at the other end of the shank.

2. A spool as claimed in claim 1 in which the transverse retainer formation (4, 13, 20, 40, 51) at said one end of the shank forms also the keeper formation.

3. A spool as claimed in claims 2 in which the combined retainer and keeper formation (4, 13, 20, 40, 51) is a generally U-shaped formation extending at generally right angles to the length of the shank.

4. A spool as claimed in any one of the preceding claims in which the retainer formation (5, 11, 25, 33, 36, 42, 49, 50, 58) at said other end of the shank forms also the torque transmitting formation.

5. A spool as claimed in any one of the preceding claims in which the length of the shank is from about 10 to about 50 times the diameter of the shank.

6. A spool as claimed in claim 5 in which the length of the shank is from about 15 to 40 times the diameter of the shank.

7. A spool as claimed in any one of the preceding claims in which additional holding means (6, 28, 30) are provided for releasably engaging a cooperant cord to prevent unravelling thereof off the shank under conditions in which tension is removed from the tension member.

8. A spool as claimed in any one of the preceding claims in which the spool is formed from a suitable gauge of metal wire or rod that is bent to form a generally straight shank in the middle; a combination retainer formation and keeper formation at one end; and a combination retainer formation and torque transmitting formation at the other end.

9. A spool as claimed in any one of the preceding claims in which the torque transmitting formation is a handle (5,11) formed integral with the shank.

10. A spool as claimed in any one of claims 1 to 8 in which the torque transmitting formation (42, 49, 50, 58) is adapted for cooperation with a separate manually operable tool (44, 52) in the form of a crank.

11. A spool as claimed in claim 10 in which the spool has a generally axially extending axle (43, 59) for cooperation with a bore or socket in a cooperant part of said manually operable tool in order to align said part and the spool approximately axially during cooperant use thereof.

12. A method of shortening a cord comprising the steps of associating the keeper formation of a spool as claimed in any one of the preceding claims with the cord; rotating the shank generally about its own axis by means of the torque transmitting formation with the shank extending transverse to the cord so as to wind cord around the shank to a required extent; and releasing the torque

transmitting formation such that the shank extends in the same general direction as the cord and the transverse retainer formations at each end serve to prevent unravelling of the cord from the shank.

13. A method as claimed in claim 12 in which the spool is manipulated such that the shank extends at an incline to the cord, at least during rotation of the shank to initiate winding of the cord around the shank and, in the case that a plurality of revolutions of the shank are required to shorten the length thereof adequately, winding said plurality of revolutions on the shank towards said one end thereof having the keeper formation, this being effected by manipulating the angle at which the shank extends transverse to the general length of the cord, followed by a decrease in the angle at which the shank extends relative to the cord so that a final revolution or part revolution of the cord spirals along a substantial portion of the length of the shank.

14. A picture having a cord for suspending it from a suspension point and spool as claimed in any one of claims 1 to 11 associated with the cord.